

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): A snapshot tree structure, comprising:

a base volume storing a current user data;

a first snapshot descending from the base volume, the first snapshot being created at a first time, the first snapshot comprising:

a first table comprising a first plurality of entries corresponding to first portions of block addresses;

a second table comprising a second plurality of entries corresponding to second portions of the block addresses;

a third table comprising a third plurality of entries corresponding to third portions of the block addresses;

wherein:

one of the first plurality of entries contains a pointer to the second table;

one of the second plurality of entries contains a pointer to the third table;

one of the third plurality of entries contains a pointer to a data of the base volume at the first time before the data is modified in the base volume;

a second snapshot descending from the first snapshot, the second snapshot being created at a second time earlier than the first time.

Claim 2 (currently amended): The snapshot tree structure of claim 1, wherein the second snapshot ~~comprising~~ comprises:

another first table comprising the first plurality of entries corresponding to the first portions of the block addresses;

another second table comprising the another second plurality of entries corresponding to the second portions of the block addresses;

another third table comprising ~~the~~ another third plurality of entries corresponding to ~~the~~ third portions of the block addresses;

wherein:

one of the first plurality of entries in said another first table contains a pointer to said another second table;

one of ~~the~~ said another second plurality of entries in said another second table contains a pointer to said another third table;

one of ~~the~~ said another third plurality of entries in said another third table contains a pointer to another data of the base volume at the second time before said another data is modified in the base volume.

Claim 3 (original): The snapshot tree structure of claim 2, wherein the first and the second snapshots are read-only snapshots.

Claim 4 (original): The snapshot tree structure of claim 2, wherein the first snapshot is a read-only snapshot and the second snapshot is a read-write snapshot.

Claim 5 (original): A method for creating a snapshot tree structure, comprising:

creating a base volume;

at a first time, creating a first snapshot descending from the base volume, said creating a first snapshot comprising:

creating a first table comprising a first plurality of entries corresponding to first portions of block addresses;

after said creating a first snapshot, receiving a write to a data block in the base volume at a block address;

in response to said receiving a write, copying an original value of the data block to the first snapshot, comprising:

creating a second table comprising a second plurality of entries corresponding to second portions of block addresses;

writing one of the first plurality of entries corresponding to a first portion of the block address with a pointer leading to the second table;

creating a third table comprising a third plurality of entries corresponding to third portions of block addresses;

writing one of the second plurality of entries corresponding to a second portion of the block address with a pointer leading to the third table;

writing the original value of the data block to a new data block;

writing one of the third plurality of entries corresponding to a third portion of the block address with a pointer leading to the new data block;

writing a new value in the data block in the base volume;

at a second time after the first time, creating a second snapshot descending from the base volume, said creating a second snapshot comprising:

creating another first table comprising the first plurality of entries corresponding to the first portions of block addresses;

inserting the second snapshot between the base volume and the first snapshot, wherein the first snapshot now descends from the second snapshot.

Claim 6 (currently amended): The method of claim 5, further comprising, after said creating a second snapshot:

receiving another write to ~~said data block~~ or another data block in the base volume, said another data block having another block address;

in response to said receiving another write, copying another original value of ~~said data block~~ or said another data block to the second snapshot, comprising:

creating another second table comprising ~~the~~ another second plurality of entries corresponding to ~~the~~ second portions of the block addresses;

writing, in said another first table, one of the first plurality of entries corresponding to a first address portion of ~~said data block~~ or said another data block with a pointer leading to said another second table;

creating another third table comprising ~~the~~ another second plurality of entries corresponding to third portions of block addresses;

writing, in said another second table, one of the second plurality of entries corresponding to a second address portion of ~~said data block~~ or said another data block with a pointer leading to said another third table;

writing said another original value of ~~said one of the data block~~ and said another data block to another new data block;

writing, in said another third table, one of the third plurality of entries corresponding to a third address portion of ~~said data block~~ or said another data block with a pointer leading to said another new data block;

writing said another new value in ~~said data block~~ or said another data block in the base volume.

Claim 7 (original): The method of claim 6, wherein the first and the second snapshots are read-only snapshots.